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Scientific, Engineering, Response and Analytical Services
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leidos

DATE: November 13, 2018

TO: Joe Schaefer, U.S. EPA/ERT Work Assignment Manager

THROUGH: Paul Carter, SERAS Program Manager PC

FROM: Stephen Simonetti, SERAS Task Leader PS for SS

SUBJECT: TONAWANDA COKE AIR, TONAWANDA, NY
WORK ASSIGNMENT #SER00359 - TRIP REPORT

BACKGROUND

Under this Work Assignment (WA), Scientific, Engineering, Response and Analytical Services (SERAS) contract personnel provided assistance to the Environmental Protection Agency/Environmental Response Team (EPA/ERT) and EPA Region 2 by performing air monitoring and sampling in neighborhoods surrounding the Tonawanda Coke Corporation located at 3875 River Road in Tonawanda, Erie County, New York (NY). The purpose of this project was to monitor for benzene as volatile organic compounds (VOCs), sulfur dioxide (SO_2) and particulates. Twenty-four hour air samples were also collected in SUMMA® canisters and analyzed for benzene only.

In 1917, the first coke ovens were put into service at the Tonawanda Coke Corporation. On October 9, 2018, The New York State Department of Environmental Conservation (NYSDEC) announced that it would take up a request from the U.S. Attorney's Office to oversee the shutdown of the Tonawanda Coke facility on River Road (Niagara Gazette, accessed 10/13/18). The shutdown of the plant began on Sunday, October 14, 2018.

The EPA/ERT was requested by EPA Region 2 to perform air sampling and monitoring. All of the initial work was carried out under the Emergency Response Work Assignment (WA) 0-001 and was later transferred to this site specific WA.

OBSERVATIONS AND ACTIVITIES

Equipment and technical support to conduct continuous air monitoring for particulate fraction of 2.5 microns (µm) ($PM_{2.5}$), VOCs as benzene and SO_2 were deployed on site. In addition, 24-hour ambient air sampling for benzene was conducted using SUMMA® canisters.

Particulate monitoring was performed using the TSI Inc., DustTrak DRX Model 8533 aerosol monitor (DustTrak). Additional monitoring was performed for VOCs as benzene and SO_2 using RAE Systems MultiRAE monitors.

All air monitoring instrumentation was connected to ERT's wireless data acquisition system (VIPER). This allowed EPA Region 2, EPA/ERT, and SERAS personnel to remotely access air monitoring data in real-time from multiple locations. SERAS personnel utilized the VIPER data acquisition management system to generate real-time time-weighted averages for the monitored compounds to assist EPA Region 2/ERT.

Six fixed monitoring locations were selected where MultiRAEs and DustTraks were deployed; all locations were selected in consultation with EPA Region 2 and EPA/ERT. These fixed monitoring locations were based on wind direction and/or other factors deemed to be relevant to health and safety of the public.

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The monitoring and sampling event began on October 14, 2018 (at TCP-01, TCP-02, TCP-03, TCP-04 and TCP-05) and was completed on October 21, 2018. Sampling locations coincided with the monitoring locations. Location TCP-06 began air monitoring and sampling activities on October 15, 2018. Additionally, location TCP-06 was moved to a different location on the property due to access issues on October 19, 2018. Figure 1 depicts the air monitoring and sampling locations. Appendix A contains VIPER Work Sheets and field notes taken by SERAS personnel during onsite activities throughout the air monitoring event.

AIR MONITORING

Air monitoring began on October 14, 2018 at approximately 2100 and continued through October 21, 2018 to approximately 1050. Air monitoring for particulates was performed utilizing a DustTrak, a particulate monitor which continuously monitors the real-time concentration of airborne dust, smoke, mists and fumes. The DustTrak covers a measurement range from 0.001 milligrams per cubic meter (mg/m^3) to 150 (mg/m^3).

Air monitoring for VOCs was performed utilizing MultiRAE monitors, manufactured by RAE Systems. The MultiRAE is an active portable gas multi-sensor monitor designed to provide continuous air monitoring in hazardous environments. A photo-ionization detector (PID) was used to detect organic vapors using a 10.6 eV (electron volts) lamp. The unit can detect trace quantities of volatile organics in the air with a range of 0.1 to 2,000 parts per million (ppm). MultiRAE units were also equipped with a sensor to monitor SO_2 with a range of 0.1 to 20 ppm.

MultiRAEs and DustTrak monitors were connected to ERT's VIPER data acquisition system. The VIPER system utilizes ERT's VIPER Survey Controller application to manage data collection using Safe Environment Engineering's LifeLine wireless monitoring system. LifeLine is comprised of a Lifeline Interoperable Network Communicator (LINC) which is physically connected to each air monitoring instrument. The LINC connects the instrument to a Gateway via Wi-Fi. The Gateways provided a data connection from Survey Controller to the LINC through internet access using cellular air cards and Wi-Fi, transmitting the monitoring data from the instrument to Survey Controller. The data was presented and archived on the ERT VIPER Deployment Manager website. The regional OSCs and ERT personnel were provided with access to site-specific monitoring data through the VIPER Deployment Manager website.

The Deployment Manager website for this site was monitored by EPA and SERAS personnel while on site to monitor for hardware or software issues. If a hardware or software issue was detected that needed on-site attention, SERAS personnel responded to the issue as quickly as possible. All monitoring units were regularly inspected and calibrated as needed by SERAS field personnel in order to provide a continuous data stream to VIPER. The Region 2 OSC was provided with access to site-specific monitoring data through the VIPER Deployment Manager website.

Routine maintenance included voltage readings and battery replacement on LINCs, Gateways, DustTraks and MultiRAEs; calibration and replacement of sensors and PID lamps when required; and inspection of water trap filters for obstructions and moisture.

AIR SAMPLING

Ambient air sampling began on October 14, 2018 and concluded on October 21, 2018, samples were taken from the breathing zone outside in the vicinity of the facility. Initially five sample locations were utilized for the first 24-hours sampling period; an additional sixth location (TCP-06) was added during all of the remaining sampling periods. A total of 53 SUMMA® samples, including trip blanks, were collected for 24-hour sampling periods from October 14, 2018 to October 21, 2018. Samples collected on October 15, 2018 were collected over an approximate 18-hour period. Samples collected on October 20, 2018 and October 21, 2018 had an approximate six hour overlap due to the timing of gas flaring ceasing at the facility on October 20, 2018 at approximately 0800.

All samples were collected using SUMMA® canisters equipped with restrictive orifices set at an approximate flow rate of 3.5 milliliters per minute (mL/min) to collect between four to five liters of air during each 24-hour sampling period. Collocated ambient air samples were collected every other day.

After the 24-hour sampling period had elapsed, the ambient air samples collected in SUMMA® canisters were retrieved from each location and properly documented in accordance with SERAS Standard Operating Procedure (SOP) #1704, *SUMMA® Canister Sampling* and SOP #2002, *Sample Documentation.*

Fifty-three SUMMA Canisters were collected and delivered under chain of custody (COC) to SERAS Laboratory for analysis in accordance to SERAS SOP #1814, *Analysis of Volatile Organic Compounds (VOCs) in SUMMA Canister Air Samples by Gas Chromatography/Mass Spectrometry (GC/MS).*

Appendix B contains the SUMMA® Sampling Work Sheets for the monitoring event.

RESULTS

Benzene was not detected in any of the SUMMA® samples.

Appendix C contains the Final Analytical Report for all of the samples collected.

MultiRAE data measurements did not exceed the action level of 5.0 ppm for VOCs nor a 10 minute time-weighted average of 0.2 ppm for SO_2 at any location. There were no exceedances of the $PM_{2.5}$ 24-hour time weighted average of 35µg/m^3 for the DustTrak data measurements at any location.

FUTURE ACTIVITIES:

No further activities are anticipated at this time.

cc: Central File WA SER00359 (w/attachments)
Electronic File: I:/Archive/SERAS/0359/D/TR/0359-DTR-111318
Paul Carter, SERAS Program Manager (cover page only)

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Figure
Sampling and Monitoring Locations
Tonawanda Coke Air
Tonawanda, New York
November 2018

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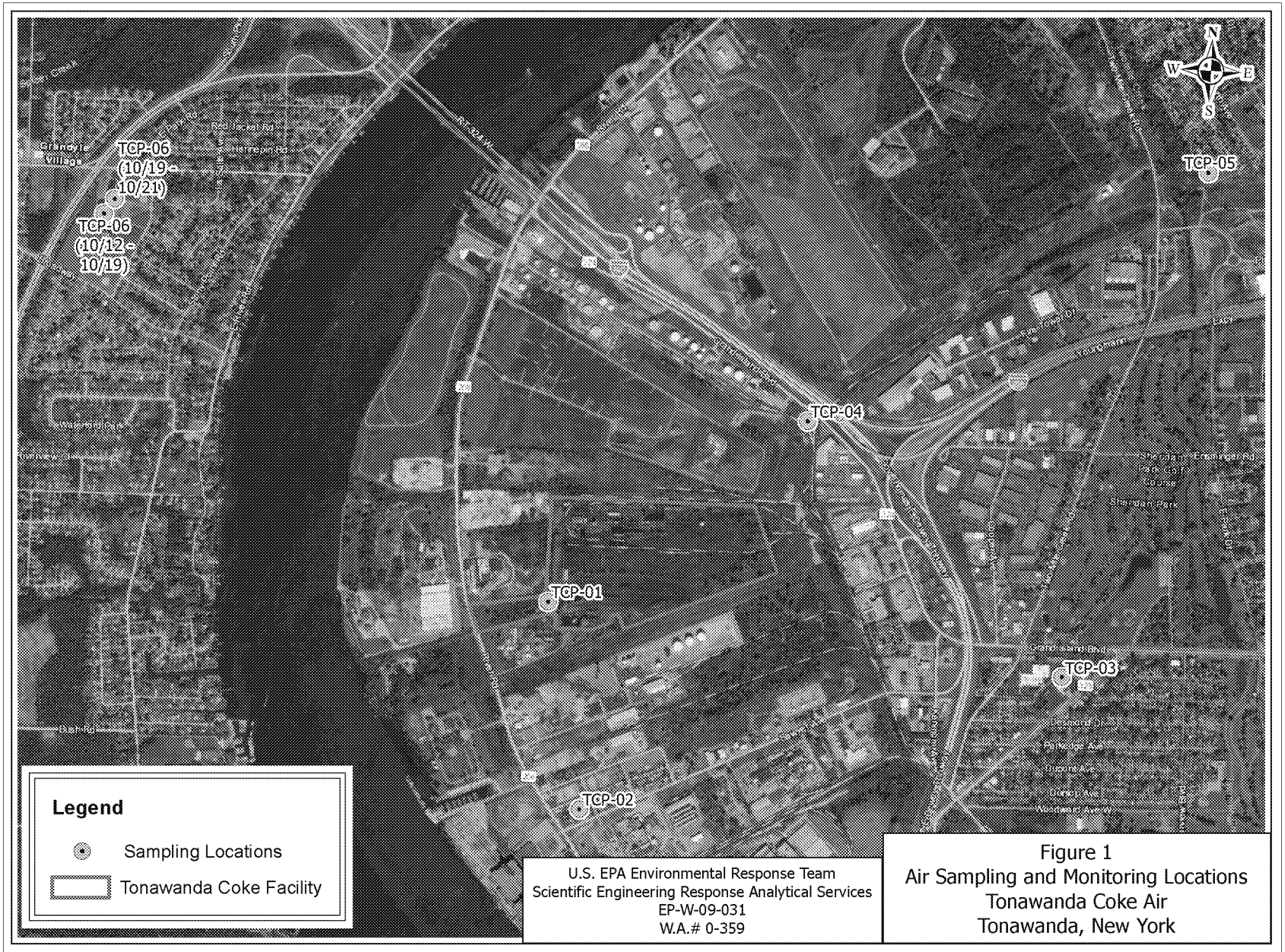

U.S. EPA Environmental Response Team
Scientific Engineering Response Analytical Services
EP-W-09-031
W.A.# 0-359

Figure 1
Air Sampling and Monitoring Locations
Tonawanda Coke Air
Tonawanda, New York

APPENDIX A
Viper Work Sheets
Tonawanda Coke Air
Tonawanda, New York
November 2018

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EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Viper Work Sheet

Site: Tonawanda Coke

WA# 359

Sampler: Simonetti/DuBois/Volker/Magan

U.S. EPA/ERT WAM: Schaffer

Date: 10/14/18

SERAS Task Leader: Simonetti

Gateway#/ SSID	Legacy (Y/N)	Mesh # (Y/N)	LNC #	Fixed/ Mobile	Instrument	Location /Sensors/Power/Notes
19			97		MR	TCP-02
			99		DT	
16-5			104		mr	TCP-03
			92		DT	
6			98		mr	TCP-01
			90		DT	
4A			102		mr	TCP-04
			94		DT	
2			101		mr	TCP-05
			96		DT	
17			103		HR	TCP-06 Summary 10/15/2018 3:57pm
			95		DT	

Notes:

APPENDIX B
SUMMA® Sampling Work Sheets
Tonawanda Coke Air
Tonawanda, New York
November 2018

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EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

SUMMA Sampling Work Sheet

Site: Tonawanda Coke

Sampler: DuBois, Simonetti, Volker, Magan

Date Start: 10/14/18 Date Stop: 10/15/18

WA# 0-359

U.S. EPA/ERT WAM: Schaefer

SERAS Task Leader: Simonetti

Sample #	Location	Sub-Location	Matrix	Summa #	Orifice ID	Analysis/ Method	Start Pressure	Flow Rate (Start)	Time/(Start)	Time/(Stop)	End Pressure
359 0012001	~~River Road~~ ~~TCP~~ TCP-02	AMB	AIR	C10567	223003	TO-15 (SOP 1814)	-28.5	-3.9	2043	1505	-7.0
359 CO 0012002	TCP-02	AMB-CO	↓	C10607	13836 ~~134~~	↓	-28.5	-3.7	2043	1505	-7.5
359-0003	TCP-03	AMB	↓	C10580	14011	(AD)	-28 ~~-26~~	-3.6	2114	1522	-8.0
-0004	TCP-01	AMB	↓	C10573	223026	(AD)	-28 ~~-26~~	-3.3	2229	1543	-10.5
-0005	TCP-04	AMB	↓	C561506	14009	↓	-28	-3.4	2316	1555	-11.0
-0006	TCP-05	AMB	↓	C10591	13790	↓	-27.5	-3.4	2349	1613	-10.5
-0007	TRIP	–	↓	13744	–	↓	-28.5	–	2000	1530	-28.5

MET Station on Site?: Y / N | Flow meter: FSH034 | NIST Gauge#: 0012184 | NIST Gauge#: 00042206

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

SUMMA Sampling Work Sheet

Site: Tonawanda Coke

WA#: 359

Sampler: Simonetti / Magan / Volkor / Dubois

U.S. EPA/ERT WAM: Schaefer

Date Start: 10/15/18

Date Stop: 10/16/18

SERAS Task Leader: Simonetti

Sample #	Location	Sub-Location	Matrix	Summa #	Orifice ID	Analysis/ Method	Start Pressure	Flow Rate (Start)	Time/(Start)	Time/(Stop)	End Pressure
359-0008	TCP-02	AMB	A	001934	223042	SOP 1814	-28.5	3.4	1508	1500	-1.5
-0069	TCP-03	↓	↓	10593	13942	↓	-28.5	3.4	1525	1513	-3.5
-0010	TCP-01			10531	13959		-28.5	3.4	1545	1533 (SS)	-2.0
-0011	TCP-04			10597	223029		-28.5	3.3	1557	1517	-2.5
-0012	TCP-05			2033	14040		-28.5	3.5	1616	~~[illegible]~~ 1631 (SS)	-1.0
-0013	TCP-06			1900	223010	~~223010~~ -28		3.5	1557	~~1631~~ (SS) 1612	-.5
-0014	Trip	—		10571	—		-27.5	—	15:00		

MET Station on Site?: Y / N	Flow meter: FS4634	NIST Gauge#:	42188	NIST Gauge#:	42206

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Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

SUMMA Sampling Work Sheet

Site: Tonawanda Lake
WA# 359
Sampler: Simonette/Volker
U.S. EPA/ERT WAM: Schaffer
Date Start: 10/16/18 Date Stop: 10/17/18
SERAS Task Leader: Simonette

Sample #	Location	Sub-Location	Matrix	Summa #	Orifice ID	Analysis/ Method	Start Pressure	Flow Rate (Start)	Time/(Start)	Time/(Stop)	End Pressure
359-0015	TCP-02	AMB	AIR	10554	18924	SOP 1814	-27.5	-3.3	1501	1501	-6.5
-0016	TCP-03	AMB		10590	13998		-27.5	-3.3	1514	1514	-4.5
-0017	TCP-03	AMB-CO		2046	14017		-28	-3.7	1514	1514	-2.0
0018	TCP-01	AMB		10546	22303		-27.5	-3.7	1533	1533	-2.5
0019	TCP-04	AMB		14401	14024		-28	-3.3	1517	1516	-0.0
20	TCP-06	↓		1991	13793		-28	-3.4	1612	1609	-3.0
21	TCP-05			10418	22303		-28	-3.5	1631	1626	-2.5
22	TRIP	↓	↓	2008	14021	↓	-28.5	~~-3.3~~ -3.3		1630	-2.5

MET Station on Site?: Y / N | Flow meter: FS4034 | NIST Gauge#: 42185 | NIST Gauge#: 49 4/2206

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EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

SUMMA Sampling Work Sheet

Site: TONAWANDA COKE

Sampler: SYMANSKI / VOLKER

Date Start: 10/17/18 Date Stop: 10/18/18

WA# 359

U.S. EPA/ERT WAM: SCHAEFER

SERAS Task Leader: SYMANSKI

Sample #	Location	Sub-Location	Matrix	Summa #	Orifice ID	Analysis/ Method	Start Pressure	Flow Rate (Start)	Time/(Start)	Time/(Stop)	End Pressure
359-0023	TCP-02	AMB	AIR	10584	13922	SERAS SOP 1814	-29	-3.4	1502	1500	-2.5
24	TCP-03			2021	13952		-28.5	-3.4	1515	1513	-2.0
25	TCP-01			15740	13917		-28.5	-3.4	1533	1530	-1.5
26	TCP-04			10539	223057		-28.5	-3.4	1546	1543	-0.0
27	TCP-06			2060	13908		-29	-3.5	1609	1559	-0.0
28	TCP-05			10598	13997		-29.5	-3.3	1627	1614	-1.6
29	TRIP BLANK			13735			-28.5			1610	-28.5

MET Station on Site?: Y / N | Flow meter: FS4034 | NIST Gauge#: 1/2/86 | NIST Gauge#: 42206

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

SUMMA Sampling Work Sheet

Site: Tonawanda Coke

Sampler: Simonetti / Volker

Date Start: 10/10/18 Date Stop: 10/19/18

WA# 359

U.S. EPA/ERT WAM: Sweeney

SERAS Task Leader: Simonetti

Sample #	Location	Sub-Location	Matrix	Summa #	Orifice ID	Analysis/ Method	Start Pressure	Flow Rate (Start)	Time/(Start)	Time/(Stop)	End Pressure
359-0030	TCP-02	Ambient	Air	10604	13911	Soras SOP 1614	-29.5	-3.4	1500	1455	-3.0
31	TCP-03			10594	13906		-30	-3.4	1514	1507	-2.0
32	TCP-03 CD			10583	13990		-30	-3.4	1514	1507	-2.0
33	TCP-SS01			10616	22302H		-30	-3.5	1530	1523	-2.0
34	TCP-04			10543	13953		-29.5	-3.4	1543	1534	-3.5
35	TCP-06			10595	13951		-30	-3.4	1559	1550	-0.5
36	TCP-05			10620	13925		-29.5	-3.5	1615	1617	-1.5
37	TRIP Blank			2057	-		-	-	-	1625	-29.5

MET Station on Site?: Y / N	Flow meter: TG-1634	NIST Gauge#:	4/2/18	NIST Gauge#:	412206

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EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

SUMMA Sampling Work Sheet

Site: Tonawanda Coke
Sampler: Simoneaux/Fowler
Date Start: 10/19/16 Date Stop: 10/20/16

WA# 359
U.S. EPA/ERT WAM: Schaefer
SERAS Task Leader: Simoneaux

Sample #	Location	Sub-Location	Matrix	Summa #	Orifice ID	Analysis/ Method	Start Pressure	Flow Rate (Start)	Time/(Start)	Time/(Stop)	End Pressure
359-0038	TCP-02	AMBIENT	AIR	10542	13927	SERAS SOP 1814	-29	-3.1	1455	1450	-2.5
0039	TCP-03	↓	↓	10599	13991	↓	-29.5	-3.4	1508	1503	-5.0
0040	TCP-01			2049	1409		-29.5	-3.3	1523	1517	-4.5
0041	TCP-04			1822	13933		-29.5	-3.3	1534	1530	-9.0
0042	TCP-06			1986	13960		-29	-3.6	1601	1557	-2.0
0043	TCP-05			10552	13961		~~-29~~ -30	-3.5	1621	1617	-4.0
0044	FIELD BLANK			2028					1615		-29

MET Station on Site?: Y / N | Flow meter: FS4034 | NIST Gauge#: 42188 | NIST Gauge#: 42206

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

SUMMA Sampling Work Sheet

Site: Tonawanda Coke

Sampler: Simonetti/Volker

Date Start: 10/20/16 Date Stop: 10/21/16

WA# 359

U.S. EPA/ERT WAM: Schaefer

SERAS Task Leader: Simonetti

Sample #	Location	Sub-Location	Matrix	Summa #	Orifice ID	Analysis/ Method	Start Pressure	Flow Rate (Start)	Time/(Start)	Time/(Stop)	End Pressure
359-0045 0003	TCP-02	Ambient Air	Air	10529	223018	SOPAS SOP 18/4	-29	-3.4	0903	857	-6.5
0046	TCP-03			14397	13915		-29	-3.4	0917	910	-2.0
0047	TCP-01			10615	223015		-29	-3.4	0936	924	-1.0
0048	TCP-04			10563	13987		-29	-3.4	0948	939	-0.5
0049	TCP-04 CO			10617	223016		-29	-3.4	0948	939	-1.5
0050	TCP-06			15417	223019		-29	-3.4	1008	957	-1.5
0051	TCP-05			10596	223020		-29	-3.4	1024	1016	-1.0
0052	Field Blank			1980			-29 +5			1019	-29.0

MET Station on Site?: Y / N	Flow meter: FS4034	NIST Gauge#: 42188	NIST Gauge#: 42206

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APPENDIX C
Final Analytical Reports
Tonawanda Coke Air
Tonawanda, New York
November 2018

ED_002831_00000176-00016

ANALYTICAL REPORT

Prepared by
Leidos Innovations Corporation
Scientific, Engineering, Response and Analytical Services

Tonawanda Coke Site
Buffalo, NY

October 2018

EPA Work Assignment No. SERAS-359
LEIDOS Work Order No. SER00359
EPA Contract No. EP-W-09-031

Submitted to
J. Schaefer
EPA/ERT
2890 Woodbridge Avenue
Edison, NJ 08837

D. Killeen — Date: 10/18/2018
QA/QC Officer

Analysis by:
ERT/SERAS Laboratory

P. Carter — Date: 10/18/18
Program Manager

Prepared by:/Reviewed by:
S. Capil/ R. Varsolona

ED_002831_00000176-00017

Table of Contents

Appendix A will be furnished on request.

ED_002831_00000176-00018

TESTING LABORATORIES INFORMATION

Analysis of Volatile Organic Compounds in Air by SERAS Method #1814 "*Analysis of Volatile Organic Compounds (VOCs) in SUMMA Canister Air Samples by Gas Chromatography/Mass Spectrometry (GC/MS)*"

ERT/SERAS Laboratory
2890 Woodbridge Avenue
Edison, NJ 08837

All analyses were performed according to our NELAP-approved quality assurance program. The test results meet the requirements of the current NELAP standards, where applicable, except as noted in the laboratory case narrative provided. Results are intended to be considered in their entirety and apply only to those analyzed and reported herein.

ERT/SERAS Laboratory is certified by the New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID # 12023 for VOC analysis in air.

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Detailed Sample Information

SERAS Sample #	Field Sample #
R810001-01	359-0002
R810001-02	359-0003
R810001-03	359-0004
R810001-04	359-0005
R810001-05	359-0006
R810001-06	359-0001
R810001-07	359-0007

ED_002831_00000176-00020

Introduction

SERAS personnel, in response to WA# SERAS-359, provided analytical support for environmental samples collected from the Tonawanda Coke Site in Buffalo, NY as described in the following table. The support also included QA/QC, data review and preparation of an analytical report containing analytical and QA/QC results.

The samples analyzed at SERAS were treated with procedures consistent with those specified in SERAS SOP #1008, *Sample Receiving, Handling and Storage*.

Chain of Custody #	Number of Samples	Sampling Date	Date Received	Date Analyzed	Matrix	Analysis/ Method	Laboratory	Data Package
2-101518-142808-0001	2	10/15/18	10/16/18	10/16/18	Ambient Air	VOC/SERAS SOP #1814	ERT/SERAS	AD 042
2-101518-143956-0002	2				Ambient Air			
2-101518-144039-0003	2				Ambient Air			
2-101518-144158-0004	1				Air			

Case Narrative

Sampling was conducted as per the site-specific Quality Assurance Project Plan (QAPP) and analyzed by the analytical methods as stated in the QAPP. The laboratory reported the data to three significant figures. Any other representation of the data is the responsibility of the user. Data were validated using a Stage 4 validation done manually (S4VM) in accordance with the "Guidance for Labeling Externally Validated Data for Superfund Use." All data validation flags have been inserted into the results tables.

VOCs in Air Package AD 042

The data package was examined and found to be acceptable.

The results presented in this report only relate to the samples analyzed. All results are intended to be considered in their entirety. The Environmental Response Team/Scientific, Engineering, Response and Analytical Services laboratory is not responsible for utilization of less than the complete report.

ED_002831_00000176-00021

Summary of Abbreviations

BFB	Bromofluorobenzene
BS	Blank Spike
BSD	Blank Spike Duplicate
^{O}C	Degree Centigrade
COC	Chain of Custody
conc	concentration
cont	continued
PCDD/PCDF	Polychlorinated dibenzo-p-dioxins (PCDD) and Polychlorinated dibenzofurans (PCDF)
DFTPP	Decafluorotriphenylphosphine
EMPC	Estimated maximum possible concentration
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/MS	Gas Chromatography/ Mass Spectrometry
Hg-CVAA	Mercury-Cold Vapor Atomic Absorption
ICP-AES	Inductively Coupled Plasma- Atomic Emission Spectroscopy
ID	Identification
IS	Internal Standard
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MDA	Minimum Detectable Activity
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular Weight
NA	Not Applicable or Not Available
NAD	Normalized Absolute Difference
NC	Not Calculated
NR	Not Requested/Not Reported
% D	Percent Difference
% R	Percent Recovery
SOP	Standard Operating Procedure
PCB	Polychlorinated Biphenyl
PDS	Post Digestion Spike
Percent RSD	Percent Relative Standard Deviation
ppbv	parts per billion by volume
ppm	parts per million
pptv	parts per trillion by volume
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RL	Reporting Limit
RPD	Relative Percent Difference
S4VM	Stage 4 validation done manually
SIM	Selected Ion Monitoring
SERAS	Scientific Engineering Response and Analytical Services
TIC	Tentatively Identified Compound
TCLP	Toxicity Characteristic Leaching Procedure
SVOC	Semi Volatile Organic Compound
VOC	Volatile Organic Compound
*	Value exceeds the acceptable QC limits

m^3	cubic meter	g	gram	kg	kilogram	L	liter
µg	microgram	µL	microliter	mg	milligram	mL	milliliter
ng	nanograms	pg	picogram	pCi	picocurie	σ	sigma

Data Validation Flags

J	Value is estimated	R	Rejected or Value is unusable
J+	Value is estimated high	U	Not detected
J-	Value is estimated low	UJ	Not detected and RL is estimated

Rev. 01/01/15, YRM

ED_002831_00000176-00022

Table 1.1a Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		NA			R810001-07			R810001-03	
Sample Number		PS-MethodBlank-101618			359-0007			359-0004	
Sample Location					Trip Blank			TCP-01	
Date Analyzed		10/16/2018			10/16/2018			10/16/2018	
Matrix		Air			Air			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv
71-43-2	Benzene	U	0.0200	0.00342	U	0.0200	0.00342	U	0.400	0.0685

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		R810001-06			R810001-01			R810001-02	
Sample Number		359-0001			359-0002			359-0003	
Sample Location		TCP-02			TCP-02CO			TCP-03	
Date Analyzed		10/16/2018			10/16/2018			10/16/2018	
Matrix		Ambient Air			Ambient Air			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.0685	U	0.400	0.0685	U	0.400	0.0685

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		R810001-04			R810001-05		
Sample Number		359-0005			359-0006		
Sample Location		TCP-04			TCP-05		
Date Analyzed		10/16/2018			10/16/2018		
Matrix		Ambient Air			Ambient Air		
Test Type		Initial			Initial		
Total or Dissolved		N			N		
CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.0685	U	0.400	0.0685

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Table 1.1b Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	NA	R810001-07	R810001-03
Sample Number	PS-MethodBlank-101618	359-0007	359-0004
Sample Location		Trip Blank	TCP-01
Date Analyzed	10/16/2018	10/16/2018	10/16/2018
Matrix	Air	Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

		Result	*RL*	*MDL*	Result	*RL*	*MDL*	Result	*RL*	*MDL*
CAS No	Analyte	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
71-43-2	Benzene	U	0.0639	0.0109	U	0.0639	0.0109	U	1.28	0.219

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	R810001-06	R810001-01	R810001-02
Sample Number	359-0001	359-0002	359-0003
Sample Location	TCP-02	TCP-02CO	TCP-03
Date Analyzed	10/16/2018	10/16/2018	10/16/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

		Result	*RL*	*MDL*	Result	*RL*	*MDL*	Result	*RL*	*MDL*
CAS No	Analyte	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
71-43-2	Benzene	U	1.28	0.219	U	1.28	0.219	U	1.28	0.219

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	R810001-04	R810001-05
Sample Number	359-0005	359-0006
Sample Location	TCP-04	TCP-05
Date Analyzed	10/16/2018	10/16/2018
Matrix	Ambient Air	Ambient Air
Test Type	Initial	Initial
Total or Dissolved	N	N

		Result	*RL*	*MDL*	Result	*RL*	*MDL*
CAS No	Analyte	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
71-43-2	Benzene	U	1.28	0.219	U	1.28	0.219

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Table 2.1 Results of the LCS Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: LCS 101618

Analyte	LCS Spike Amount ppbv	LCS Recovered ppbv	% Recovery	QC Limits % Recovery
Benzene	1.00	0.949	95	78 - 122

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Table 2.2 Results of the Duplicate Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: 359-0006

Analyte	Initial Analysis ppbv	Duplicate Analysis ppbv	RPD	QC Limit RPD
Benzene	U	U	NC	≤25

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SERAS-359-DAR-101818

USEPA
DateShipped: 10/15/2018
CarrierName:
AirbillNo:
WO# R910001

CHAIN OF CUSTODY RECORD

Site #: 359
Contact Name: Larry Martin/Samples Receiving
Contact Phone: 609-865-9306

No: 2-101518-142808-0001
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	TAT	TAT Units	Matrix	Sample Date	Sample Time	Pump #	OrificeID	Stop_Date	Stop_Time	Start Pressure	Stop Pressure
01	359-0002	TCP-02 CO	Ambient Collocated	SERAS SOP#1814	24	Hours	Ambient Air	10/15/2018	1505	10607	13956	10/15/2018	1505	-28.5	-7.5
02	359-0003	TCP-03	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/15/2018	1522	10580	14011	10/15/2018	1522	-28	-8.0

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
2/Analysis	/SERAS	10/15/18 1530	/SERAS	10/16/18 8:00	Intact
All/Analysis	/SERAS	10/16/18 10:00	/SERAS	10/16/18 10:00	

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SERAS-359-DAR-101818

USEPA
DateShipped: 10/15/2018
CarrierName:
AirbillNo:
WO# R810001

CHAIN OF CUSTODY RECORD

Site #: 359
Contact Name: Larry Martin/Samples Receiving
Contact Phone: 609-865-9306

No: 2-101518-143956-0002
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	TAT	TAT Units	Matrix	Sample Date	Sample Time	Pump #	OrificeID	Stop_Date	Stop_Time	Start Pressure	Stop Pressure
03	359-0004	TCP-01	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/15/2018	1543	10573	223026	10/15/2018	1543	-28	-10.5
04	359-0005	TCP-04	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/15/2018	1555	561506	14009 10530 10/16/18	10/15/2018	1555	-28	-11

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
24 Analysis	/SERAS	10/15/18 12:00	/SERAS	10/16/18 8:00	Intact
All Analysis	/SERAS	10/16/18 10:00	/SERAS	10/16/18 10:00	

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SERAS-359-DAR-101818

USEPA
DateShipped: 10/15/2018
CarrierName:
AirbillNo:
WO# R810001

CHAIN OF CUSTODY RECORD

Site #: 359
Contact Name: Larry Martin/Samples Receiving
Contact Phone: 609-865-9306

No: 2-101518-144039-0003
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	TAT	TAT Units	Matrix	Sample Date	Sample Time	Pump #	OrificeID	Stop_Date	Stop_Time	Start Pressure	Stop Pressure
05	359-0006	TCP-05	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/15/2018	1505	10591	13790	10/15/2018	1515	-27.5	-7.0
06	359-0001	TCP-02	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/15/2018	1617	10567	2230013	10/15/2018	1613	-28.5	-7.05

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All Analysis	/SERAS	10/15/18 1625	/SERAS	10/16/18 8:00	Intact
All Analysis	/SERAS	10/16/18 10:00	/SERAS	10/16/18 10:10	

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SERAS-359-DAR-101818

USEPA
DateShipped: 10/15/2018
CarrierName:
AirbillNo:
WO# R810001

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Larry Martin/Samples Receiving
Contact Phone: 609-865-9306

No: 2-101518-144158-0004
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	TAT	TAT Units	Matrix	Sample Date	Sample Time	Pump #	OrificeID	Stop_Date	Stop_Time	Start Pressure	Stop Pressure
07	359-0007	Trip Blank	—	SERAS SOP#1814	24	Hours	Air	10/15/2018	15:30	13744	N/A	10/15/2018	3:30:00 PM	-28.5	-28.5

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
1/Analysis	/SERAS	1535 10/16/18	/SERAS	10/16/18 8:00	Intact
All/Analysis	/SERAS	10/16/18 10:00	/SERAS	10/16/18 10:00	

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ANALYTICAL REPORT

Prepared by
Leidos Innovations Corporation
Scientific, Engineering, Response and Analytical Services

Tonawanda Coke Site
Buffalo, NY

October 2018

EPA Work Assignment No. SERAS-359
LEIDOS Work Order No. SER00359
EPA Contract No. EP-W-09-031

Submitted to
J. Schaefer
EPA/ERT
2890 Woodbridge Avenue
Edison, NJ 08837

D. Killeen 10/19/18
QA/QC Officer Date

P. Carter 10/19/18
Program Manager Date

Analysis by:
ERT/SERAS Laboratory

Prepared by:/Reviewed by:
S. Capil/ R. Varsolona

ED_002831_00000176-00031

Table of Contents

Appendix A will be furnished on request.

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TESTING LABORATORIES INFORMATION

Analysis of Volatile Organic Compounds in Air by SERAS Method #1814 "*Analysis of Volatile Organic Compounds (VOCs) in SUMMA Canister Air Samples by Gas Chromatography/Mass Spectrometry (GC/MS)*"

ERT/SERAS Laboratory
2890 Woodbridge Avenue
Edison, NJ 08837

All analyses were performed according to our NELAP-approved quality assurance program. The test results meet the requirements of the current NELAP standards, where applicable, except as noted in the laboratory case narrative provided. Results are intended to be considered in their entirety and apply only to those analyzed and reported herein.

ERT/SERAS Laboratory is certified by the New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID # 12023 for VOC analysis in air.

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Detailed Sample Information

SERAS Sample #	Field Sample #
L810002-01	359-0008
L810002-02	359-0009
L810002-03	359-0010
L810002-04	359-0011
L810002-05	359-0012
L810002-06	359-0013
L810002-07	359-0014

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ED_002831_00000176-00034

Introduction

SERAS personnel, in response to WA# SERAS-359, provided analytical support for environmental samples collected from the Tonawanda Coke Site in Buffalo, NY as described in the following table. The support also included QA/QC, data review and preparation of an analytical report containing analytical and QA/QC results.

The samples analyzed at SERAS were treated with procedures consistent with those specified in SERAS SOP #1008, *Sample Receiving, Handling and Storage.*

Chain of Custody #	Number of Samples	Sampling Date	Date Received	Date Analyzed	Matrix	Analysis/ Method	Laboratory	Data Package
2-101618-115057-0005	4	10/16/18	10/17/18	10/17/18	Ambient Air	VOC/SERAS SOP #1814	ERT/SERAS	AD 043
2-101618-121630-0006	2				Ambient Air			
2-101618-152205-0007	1				Air			

Case Narrative

Sampling was conducted as per the site-specific Quality Assurance Project Plan (QAPP) and analyzed by the analytical methods as stated in the QAPP. The laboratory reported the data to three significant figures. Any other representation of the data is the responsibility of the user. Data were validated using a Stage 4 validation done manually (S4VM) in accordance with the "Guidance for Labeling Externally Validated Data for Superfund Use." All data validation flags have been inserted into the results tables.

VOCs in Air Package AD 043

The data package was examined and found to be acceptable.

The results presented in this report only relate to the samples analyzed. All results are intended to be considered in their entirety. The Environmental Response Team/Scientific, Engineering, Response and Analytical Services laboratory is not responsible for utilization of less than the complete report.

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Summary of Abbreviations

BFB	Bromofluorobenzene
BS	Blank Spike
BSD	Blank Spike Duplicate
^{O}C	Degree Centigrade
COC	Chain of Custody
conc	concentration
cont	continued
PCDD/PCDF	Polychlorinated dibenzo-p-dioxins (PCDD) and Polychlorinated dibenzofurans (PCDF)
DFTPP	Decafluorotriphenylphosphine
EMPC	Estimated maximum possible concentration
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/MS	Gas Chromatography/ Mass Spectrometry
Hg-CVAA	Mercury-Cold Vapor Atomic Absorption
ICP-AES	Inductively Coupled Plasma- Atomic Emission Spectroscopy
ID	Identification
IS	Internal Standard
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MDA	Minimum Detectable Activity
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular Weight
NA	Not Applicable or Not Available
NAD	Normalized Absolute Difference
NC	Not Calculated
NR	Not Requested/Not Reported
% D	Percent Difference
% R	Percent Recovery
SOP	Standard Operating Procedure
PCB	Polychlorinated Biphenyl
PDS	Post Digestion Spike
Percent RSD	Percent Relative Standard Deviation
ppbv	parts per billion by volume
ppm	parts per million
pptv	parts per trillion by volume
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RL	Reporting Limit
RPD	Relative Percent Difference
S4VM	Stage 4 validation done manually
SIM	Selected Ion Monitoring
SERAS	Scientific Engineering Response and Analytical Services
TIC	Tentatively Identified Compound
TCLP	Toxicity Characteristic Leaching Procedure
SVOC	Semi Volatile Organic Compound
VOC	Volatile Organic Compound
*	Value exceeds the acceptable QC limits

m^3	cubic meter	g	gram	kg	kilogram	L	liter
µg	microgram	µL	microliter	mg	milligram	mL	milliliter
ng	nanograms	pg	picogram	pCi	picocurie	σ	sigma

Data Validation Flags

J	Value is estimated	R	Rejected or Value is unusable
J+	Value is estimated high	U	Not detected
J-	Value is estimated low	UJ	Not detected and RL is estimated

Rev. 01/01/15, YRM

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ED_002831_00000176-00036

Table 1.1a Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		NA			L810002-07			L810002-03	
Sample Number		PS-MethodBlank-101718			359-0014			359-0010	
Sample Location					Trip Blank			TCP-01 Ambient	
Date Analyzed		10/17/2018			10/17/2018			10/17/2018	
Matrix		Air			Air			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv
71-43-2	Benzene	U	0.0200	0.00342	U	0.0200	0.00342	U	0.400	0.0685

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810002-01			L810002-02			L810002-04	
Sample Number		359-0008			359-0009			359-0011	
Sample Location		TCP-02 Ambient			TCP-03 Ambient			TCP-04 Ambient	
Date Analyzed		10/17/2018			10/17/2018			10/17/2018	
Matrix		Ambient Air			Ambient Air			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.0685	U	0.400	0.0685	U	0.400	0.0685

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810002-05			L810002-06		
Sample Number		359-0012			359-0013		
Sample Location		TCP-05 Ambient			TCP-06 Ambient		
Date Analyzed		10/17/2018			10/17/2018		
Matrix		Ambient Air			Ambient Air		
Test Type		Initial			Initial		
Total or Dissolved		N			N		
CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.0685	U	0.400	0.0685

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ED_002831_00000176-00037

Table 1.1b Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		NA			L810002-07			L810002-03		
Sample Number		PS-MethodBlank-101718			359-0014			359-0010		
Sample Location					Trip Blank			TCP-01 Ambient		
Date Analyzed		10/17/2018			10/17/2018			10/17/2018		
Matrix		Air			Air			Ambient Air		
Test Type		Initial			Initial			Initial		
Total or Dissolved		N			N			N		
CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	0.0639	0.0109	U	0.0639	0.0109	U	1.28	0.219

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810002-01			L810002-02			L810002-04		
Sample Number		359-0008			359-0009			359-0011		
Sample Location		TCP-02 Ambient			TCP-03 Ambient			TCP-04 Ambient		
Date Analyzed		10/17/2018			10/17/2018			10/17/2018		
Matrix		Ambient Air			Ambient Air			Ambient Air		
Test Type		Initial			Initial			Initial		
Total or Dissolved		N			N			N		
CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	1.28	0.219	U	1.28	0.219	U	1.28	0.219

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810002-05			L810002-06		
Sample Number		359-0012			359-0013		
Sample Location		TCP-05 Ambient			TCP-06 Ambient		
Date Analyzed		10/17/2018			10/17/2018		
Matrix		Ambient Air			Ambient Air		
Test Type		Initial			Initial		
Total or Dissolved		N			N		
CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	1.28	0.219	U	1.28	0.219

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Table 2.1 Results of the LCS Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: LCS 101718

Analyte	LCS Spike Amount ppbv	LCS Recovered ppbv	% Recovery	QC Limits % Recovery
Benzene	1.00	0.917	92	78 - 122

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ED_002831_00000176-00039

Table 2.2 Results of the Duplicate Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: 359-0010

Analyte	Initial Analysis ppbv	Duplicate Analysis ppbv	RPD	QC Limit RPD
Benzene	U	U	NC	≤25

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SERAS-359-DAR-101918

USEPA
DateShipped: 10/16/2018
CarrierName:
AirbillNo: L810002
ID#: ~~R810002~~ 10/19/18

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Larry Martin/Samples Receiving
Contact Phone: 609-865-9306

No: 2-101618-115057-0005
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	TAT	TAT Units	Matrix	Sample Date	Sample Time	#	Container	Summa #	OrificeID	Start Pressure	Stop Pressure
-01	359-0008	TCP-02	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/16/2018	1500	1	Summa Canister	1934	223042	-28.5	-1.5
-02	359-0009	TCP-03	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/16/2018	1513	1	Summa Canister	10593	13942	-28.5	-3.5
-03	359-0010	TCP-01	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/16/2018	1533	1	Summa Canister	10531	13959	-28.5	-2.0
-04	359-0011	TCP-04	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/16/2018	1517	1	Summa Canister	10597	223029	-28.5	-2.5

SJS

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Summas for Analyses	[signature] Leidos/SERAS	10/16/18 1554	Jay Patel / SERAS	10/17/18 0830	Intact
All/Analysis	Jay Patel / SERAS	10/17/18 @ 11:30	Bhupinder Parmar / SERAS	10/17/18 @ 11:30	

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SERAS-359-DAR-101918

USEPA
DateShipped: 10/16/2018
CarrierName:
AirbillNo: L810002
~~L810002~~ PM 10/18/18

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Larry Martin/Samples Receiving
Contact Phone: 609-865-9306

No: 2-101618-121630-0006
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	TAT	TAT Units	Matrix	Sample Date	Sample Time	#	Container	Summa #	OrificeID	Start Pressure	Stop Pressure
-05	359-0012	TCP-05	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/16/2018	1631	1	Summa Canister	2033	14040	-28.5	-1.0
-06	359-0013	TCP-06	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/16/2018	1612	1	Summa Canister	1900	22300	-28.5	-0.5
							SDS								

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Summa for Analyses	LCERAS/SERAS	10/16/18 1630	Jay Patel / SERAS	10/17/18 @ 8:30	Intact
All Analysis	Jay Patel / SERAS	10/17/18 @ 11:30	Bhupinderkaur /SERAS	10/17/18 11@30	

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USEPA
DateShipped: 10/16/2018
CarrierName:
AirbillNo: L810002
~~L810002~~ 10/18/18

CHAIN OF CUSTODY RECORD

Site #: 359
Contact Name: Larry Martin/Samples Receiving
Contact Phone: 609-865-9306

No: 2-101618-152205-0007
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

SERAS-359-CDAR-101918

Lab #	Sample #	Location	Sub Location	Analyses	TAT	TAT Units	Matrix	Sample Date	Sample Time	#	Container	Summa #	OrificeID	Start Pressure	Stop Pressure
07	359-0014	Trip Blank		SERAS SOP#1814	24	Hours	Air	10/16/2018	1600	1	Summa Canister	10571		-27.5	

SJS

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Summa for Analysis	[signature] Loweds/SERAS	10/16/18 1637	Jay Patel / SERAS	10/17/18 @ 8:30	Intact.
All Analysis	Jay Patel / SERAS	10/17/18 @ 11:30	Bhupindu Parmar / SERAS	10/17/18 @ 11:30	

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ANALYTICAL REPORT

Prepared by
Leidos Innovations Corporation
Scientific, Engineering, Response and Analytical Services

Tonawanda Coke Site
Buffalo, NY

October 2018

EPA Work Assignment No. SERAS-359
LEIDOS Work Order No. SER00359
EPA Contract No. EP-W-09-031

Submitted to
J. Schaefer
EPA/ERT
2890 Woodbridge Avenue
Edison, NJ 08837

D. Killeen — Date
QA/QC Officer

P. Carter — 10/21/18 — Date
Program Manager

Analysis by:
ERT/SERAS Laboratory

Prepared by:/Reviewed by:
S. Capil/ R. Varsolona

ED_002831_00000176-00044

Table of Contents

Appendix A will be furnished on request.

ED_002831_00000176-00045

TESTING LABORATORIES INFORMATION

Analysis of Volatile Organic Compounds in Air by SERAS Method #1814 "*Analysis of Volatile Organic Compounds (VOCs) in SUMMA Canister Air Samples by Gas Chromatography/Mass Spectrometry (GC/MS)*"

ERT/SERAS Laboratory
2890 Woodbridge Avenue
Edison, NJ 08837

All analyses were performed according to our NELAP-approved quality assurance program. The test results meet the requirements of the current NELAP standards, where applicable, except as noted in the laboratory case narrative provided. Results are intended to be considered in their entirety and apply only to those analyzed and reported herein.

ERT/SERAS Laboratory is certified by the New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID # 12023 for VOC analysis in air.

REPORT OF LABORATORY ANALYSIS
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Detailed Sample Information

SERAS Sample #	Field Sample #
L810003-01	359-0015
L810003-02	359-0016
L810003-03	359-0017
L810003-04	359-0018
L810003-05	359-0019
L810003-06	359-0020
L810003-07	359-0021
L810003-08	359-0022

ED_002831_00000176-00047

Introduction

SERAS personnel, in response to WA# SERAS-359, provided analytical support for environmental samples collected from the Tonawanda Coke Site in Buffalo, NY as described in the following table. The support also included QA/QC, data review and preparation of an analytical report containing analytical and QA/QC results.

The samples analyzed at SERAS were treated with procedures consistent with those specified in SERAS SOP #1008, *Sample Receiving, Handling and Storage.*

Chain of Custody #	Number of Samples	Sampling Date	Date Received	Date Analyzed	Matrix	Analysis/ Method	Laboratory	Data Package
2-101718-141909-0008	4	10/17/18	10/18/18	10/18/18	Ambient Air	VOC/SERAS SOP #1814	ERT/SERAS	AD 044
2-101718-142725-0009	3				Ambient Air			
	1				Blank			

Case Narrative

Sampling was conducted as per the site-specific Quality Assurance Project Plan (QAPP) and analyzed by the analytical methods as stated in the QAPP. The laboratory reported the data to three significant figures. Any other representation of the data is the responsibility of the user. Data were validated using a Stage 4 validation done manually (S4VM) in accordance with the "Guidance for Labeling Externally Validated Data for Superfund Use." All data validation flags have been inserted into the results tables.

VOCs in Air Package AD 044

The data package was examined and found to be acceptable.

The results presented in this report only relate to the samples analyzed. All results are intended to be considered in their entirety. The Environmental Response Team/Scientific, Engineering, Response and Analytical Services laboratory is not responsible for utilization of less than the complete report.

REPORT OF LABORATORY ANALYSIS
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ED_002831_00000176-00048

Summary of Abbreviations

BFB	Bromofluorobenzene
BS	Blank Spike
BSD	Blank Spike Duplicate
^{O}C	Degree Centigrade
COC	Chain of Custody
conc	concentration
cont	continued
PCDD/PCDF	Polychlorinated dibenzo-p-dioxins (PCDD) and Polychlorinated dibenzofurans (PCDF)
DFTPP	Decafluorotriphenylphosphine
EMPC	Estimated maximum possible concentration
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/MS	Gas Chromatography/ Mass Spectrometry
Hg-CVAA	Mercury-Cold Vapor Atomic Absorption
ICP-AES	Inductively Coupled Plasma- Atomic Emission Spectroscopy
ID	Identification
IS	Internal Standard
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MDA	Minimum Detectable Activity
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular Weight
NA	Not Applicable or Not Available
NAD	Normalized Absolute Difference
NC	Not Calculated
NR	Not Requested/Not Reported
% D	Percent Difference
% R	Percent Recovery
SOP	Standard Operating Procedure
PCB	Polychlorinated Biphenyl
PDS	Post Digestion Spike
Percent RSD	Percent Relative Standard Deviation
ppbv	parts per billion by volume
ppm	parts per million
pptv	parts per trillion by volume
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RL	Reporting Limit
RPD	Relative Percent Difference
S4VM	Stage 4 validation done manually
SIM	Selected Ion Monitoring
SERAS	Scientific Engineering Response and Analytical Services
TIC	Tentatively Identified Compound
TCLP	Toxicity Characteristic Leaching Procedure
SVOC	Semi Volatile Organic Compound
VOC	Volatile Organic Compound
*	Value exceeds the acceptable QC limits

m^3	cubic meter	g	gram	kg	kilogram	L	liter
µg	microgram	µL	microliter	mg	milligram	mL	milliliter
ng	nanograms	pg	picogram	pCi	picocurie	σ	sigma

Data Validation Flags

J	Value is estimated	R	Rejected or Value is unusable
J+	Value is estimated high	U	Not detected
J-	Value is estimated low	UJ	Not detected and RL is estimated

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REPORT OF LABORATORY ANALYSIS
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ED_002831_00000176-00049

Table 1.1a Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		NA			L810003-08			L810003-01	
Sample Number		PS-Methodblank-101818			359-0022			359-0015	
Sample Location					Trip Blank			TCP-02	
Sublocation					Ambient			Ambient	
Date Analyzed		10/18/2018			10/18/2018			10/18/2018	
Matrix		Air			Blank			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv
71-43-2	Benzene	U	0.0200	0.00769	U	0.0200	0.00769	U	0.400	0.154

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810003-02			L810003-03			L810003-04	
Sample Number		359-0016			359-0017			359-0018	
Sample Location		TCP-03			TCP-03 CO			TCP-01	
Sublocation		Ambient			Ambient Collocated			Ambient	
Date Analyzed		10/18/2018			10/18/2018			10/18/2018	
Matrix		Ambient Air			Ambient Air			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.154	U	0.400	0.154	U	0.400	0.154

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810003-05			L810003-06			L810003-07	
Sample Number		359-0019			359-0020			359-0021	
Sample Location		TCP-04			TCP-06			TCP-05	
Sublocation		Ambient			Ambient			Ambient	
Date Analyzed		10/18/2018			10/18/2018			10/18/2018	
Matrix		Ambient Air			Ambient Air			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.154	U	0.400	0.154	U	0.400	0.154

REPORT OF LABORATORY ANALYSIS
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Table 1.1b Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		NA			L810003-08			L810003-01		
Sample Number		PS-Methodblank-101818			359-0022			359-0015		
Sample Location					Trip Blank			TCP-02		
Sublocation					Ambient			Ambient		
Date Analyzed		10/18/2018			10/18/2018			10/18/2018		
Matrix		Air			Blank			Ambient Air		
Test Type		Initial			Initial			Initial		
Total or Dissolved		N			N			N		
CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	0.0639	0.0246	U	0.0639	0.0246	U	1.28	0.491

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810003-02			L810003-03			L810003-04		
Sample Number		359-0016			359-0017			359-0018		
Sample Location		TCP-03			TCP-03 CO			TCP-01		
Sublocation		Ambient			Ambient Collocated			Ambient		
Date Analyzed		10/18/2018			10/18/2018			10/18/2018		
Matrix		Ambient Air			Ambient Air			Ambient Air		
Test Type		Initial			Initial			Initial		
Total or Dissolved		N			N			N		
CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	1.28	0.491	U	1.28	0.491	U	1.28	0.491

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810003-05			L810003-06			L810003-07		
Sample Number		359-0019			359-0020			359-0021		
Sample Location		TCP-04			TCP-06			TCP-05		
Sublocation		Ambient			Ambient			Ambient		
Date Analyzed		10/18/2018			10/18/2018			10/18/2018		
Matrix		Ambient Air			Ambient Air			Ambient Air		
Test Type		Initial			Initial			Initial		
Total or Dissolved		N			N			N		
CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	1.28	0.491	U	1.28	0.491	U	1.28	0.491

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Table 2.1 Results of the LCS Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: LCS 101818

Analyte	LCS Spike Amount ppbv	LCS Recovered ppbv	% Recovery	QC Limits % Recovery
Benzene	1.00	1.01	101	92 - 120

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Table 2.2 Results of the Duplicate Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: 359-0021

Analyte	Initial Analysis ppbv	Duplicate Analysis ppbv	RPD	QC Limit RPD
Benzene	U	U	NC	≤25

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SERAS-359-DAR-102218

USEPA
DateShipped: 10/17/2018
CarrierName: FedEx
AirbillNo:
WO# L8100003

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Stephen Simonetti
Contact Phone: 732-321-4293

No: 2-101718-141909-0008
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	TAT	TAT Units	Matrix	Sample Date	Sample Time	#	Container	Summa #	OrificeID	Start Pressure	Stop Pressure
01	359-0015	TCP-02	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/17/2018	1501	1	Summa Canister	10554	13924	-27.5	-6.5
02	359-0016	TCP-03	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/17/2018	1514	1	Summa Canister	10590	13998	-27.5	-4.5
03	359-0017	TCP-03 CO	Ambient Collocated	SERAS SOP#1814	24	Hours	Ambient Air	10/17/2018	1514	1	Summa Canister	2046	14017	-28	-2.0
04	359-0018	TCP-01	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/17/2018	1533	1	Summa Canister	10546	223031	-27.5	-2.5

359

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for Analyses	Leidos/SERAS	10/17/18 1541	/SERAS	10/18/18 9:00	Intact
All/Analysis	/SERAS	10/18/18 12:00	J. Patel/SERAS	10/18/18 12:00	

07

SERAS-359-DAR-102218

USEPA
DateShipped: 10/17/2018
CarrierName: FedEx
AirbillNo: L810003
WOF-R810010 10/18/18

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Stephen Simonetti
Contact Phone: 732-321-4293

No: 2-101718-142725-0009
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	TAT	TAT Units	Matrix	Sample Date	Sample Time	#	Container	Summa #	OrificeID	Start Pressure	Stop Pressure
05	359-0019	TCP-04	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/17/2018	1546	1	Summa Canister	14401	14024	-28	-0.0
06	359-0020	TCP-06	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/17/2018	1609	1	Summa Canister	1991	13793	-28	-3.0
07	359-0021	TCP-05	Ambient	SERAS SOP#1814	24	Hours	Ambient Air	10/17/2018	1626	1	Summa Canister	2048	223034	-28	-2.5
08	359-0022	Trip Blank	Ambient	SERAS SOP#1814	24	Hours	Blank	10/17/2018	1630	1	Summa Canister	2008			-28.5

SJS

Special Instructions: BENZENE ONLY, 24-HOUR TAT PRELIMS, 48 HOUR FINAL

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for Analysis	LEEDS/SERAS	10/17/18 1631	/SERAS	10/18/18 9:00	Intact
All Analysis	/SERAS	10/18/18 12:00	Jay Patel/SERAS	10/18/18 12:02	

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ANALYTICAL REPORT

Prepared by
Leidos Innovations Corporation
Scientific, Engineering, Response and Analytical Services

Tonawanda Coke Site
Buffalo, NY

October 2018

EPA Work Assignment No. SERAS-359
LEIDOS Work Order No. SER00359
EPA Contract No. EP-W-09-031

Submitted to
J. Schaefer
EPA/ERT
2890 Woodbridge Avenue
Edison, NJ 08837

D. Killeen
QA/QC Officer

10/22/18
Date

Analysis by:
ERT/SERAS Laboratory

P. Carter
Program Manager

10/21/18
Date

Prepared by:/Reviewed by:
S. Capil/ R. Varsolona

ED_002831_00000176-00056

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Appendix A will be furnished on request.

ED_002831_00000176-00057

TESTING LABORATORIES INFORMATION

Analysis of Volatile Organic Compounds in Air by SERAS Method #1814 "*Analysis of Volatile Organic Compounds (VOCs) in SUMMA Canister Air Samples by Gas Chromatography/Mass Spectrometry (GC/MS)*"

ERT/SERAS Laboratory
2890 Woodbridge Avenue
Edison, NJ 08837

All analyses were performed according to our NELAP-approved quality assurance program. The test results meet the requirements of the current NELAP standards, where applicable, except as noted in the laboratory case narrative provided. Results are intended to be considered in their entirety and apply only to those analyzed and reported herein.

ERT/SERAS Laboratory is certified by the New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID # 12023 for VOC analysis in air.

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Detailed Sample Information

SERAS Sample #	Field Sample #
L810005-01	359-0023
L810005-02	359-0024
L810005-03	359-0025
L810005-04	359-0026
L810005-05	359-0027
L810006-06	359-0028
L810005-07	359-0029

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ED_002831_00000176-00059

Introduction

SERAS personnel, in response to WA# SERAS-359, provided analytical support for environmental samples collected from the Tonawanda Coke Site in Buffalo, NY as described in the following table. The support also included QA/QC, data review and preparation of an analytical report containing analytical and QA/QC results.

The samples analyzed at SERAS were treated with procedures consistent with those specified in SERAS SOP #1008, *Sample Receiving, Handling and Storage.*

Chain of Custody #	Number of Samples	Sampling Date	Date Received	Date Analyzed	Matrix	Analysis/ Method	Laboratory	Data Package
2-101818-135423-0011	4	10/18/18	10/19/18	10/19/18	Ambient Air	VOC/SERAS SOP #1814	ERT/SERAS	AD 045
2-101818-135955-0012	2				Ambient Air			
2-101818-140213-0013	1				Blank			

Case Narrative

Sampling was conducted as per the site-specific Quality Assurance Project Plan (QAPP) and analyzed by the analytical methods as stated in the QAPP. The laboratory reported the data to three significant figures. Any other representation of the data is the responsibility of the user. Data were validated using a Stage 4 validation done manually (S4VM) in accordance with the "Guidance for Labeling Externally Validated Data for Superfund Use." All data validation flags have been inserted into the results tables.

VOCs in Air Package AD 045

The data package was examined and found to be acceptable.

The results presented in this report only relate to the samples analyzed. All results are intended to be considered in their entirety. The Environmental Response Team/Scientific, Engineering, Response and Analytical Services laboratory is not responsible for utilization of less than the complete report.

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ED_002831_00000176-00060

Summary of Abbreviations

BFB	Bromofluorobenzene
BS	Blank Spike
BSD	Blank Spike Duplicate
^{O}C	Degree Centigrade
COC	Chain of Custody
conc	concentration
cont	continued
PCDD/PCDF	Polychlorinated dibenzo-p-dioxins (PCDD) and Polychlorinated dibenzofurans (PCDF)
DFTPP	Decafluorotriphenylphosphine
EMPC	Estimated maximum possible concentration
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/MS	Gas Chromatography/ Mass Spectrometry
Hg-CVAA	Mercury-Cold Vapor Atomic Absorption
ICP-AES	Inductively Coupled Plasma- Atomic Emission Spectroscopy
ID	Identification
IS	Internal Standard
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MDA	Minimum Detectable Activity
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular Weight
NA	Not Applicable or Not Available
NAD	Normalized Absolute Difference
NC	Not Calculated
NR	Not Requested/Not Reported
% D	Percent Difference
% R	Percent Recovery
SOP	Standard Operating Procedure
PCB	Polychlorinated Biphenyl
PDS	Post Digestion Spike
Percent RSD	Percent Relative Standard Deviation
ppbv	parts per billion by volume
ppm	parts per million
pptv	parts per trillion by volume
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RL	Reporting Limit
RPD	Relative Percent Difference
S4VM	Stage 4 validation done manually
SIM	Selected Ion Monitoring
SERAS	Scientific Engineering Response and Analytical Services
TIC	Tentatively Identified Compound
TCLP	Toxicity Characteristic Leaching Procedure
SVOC	Semi Volatile Organic Compound
VOC	Volatile Organic Compound
*	Value exceeds the acceptable QC limits

m^3	cubic meter	g	gram	kg	kilogram	L	liter
µg	microgram	µL	microliter	mg	milligram	mL	milliliter
ng	nanograms	pg	picogram	pCi	picocurie	σ	sigma

Data Validation Flags

J	Value is estimated	R	Rejected or Value is unusable
J+	Value is estimated high	U	Not detected
J-	Value is estimated low	UJ	Not detected and RL is estimated

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ED_002831_00000176-00061

Table 1.1a Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		NA			L810005-07			L810005-01	
Sample Number		PS-Methodblank-101918			359-0029			359-0023	
Sample Location					Trip Blank			TCP-02	
Sublocation								Ambient	
Date Analyzed		10/19/2018			10/19/2018			10/19/2018	
Matrix		Air			Blank			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv
71-43-2	Benzene	U	0.0200	0.00769	U	0.0200	0.00769	U	0.400	0.154

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810005-02			L810005-03			L810053-04	
Sample Number		359-0024			359-0025			359-0026	
Sample Location		TCP-03			TCP-01			TCP-04	
Sublocation		Ambient			Ambient			Ambient	
Date Analyzed		10/19/2018			10/19/2018			10/19/2018	
Matrix		Ambient Air			Ambient Air			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.154	U	0.400	0.154	U	0.400	0.154

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810005-05			L810005-06			
Sample Number		359-0027			359-0028			
Sample Location		TCP-06			TCP-05			
Sublocation		Ambient			Ambient			
Date Analyzed		10/19/2018			10/19/2018			
Matrix		Ambient Air			Ambient Air			
Test Type		Initial			Initial			
Total or Dissolved		N			N			
CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	
71-43-2	Benzene	U	0.400	0.154	U	0.400	0.154	

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Table 1.1b Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		NA			L810005-07			L810005-01		
Sample Number		PS-Methodblank-101918			359-0029			359-0023		
Sample Location					Trip Blank			TCP-02		
Sublocation								Ambient		
Date Analyzed		10/19/2018			10/19/2018			10/19/2018		
Matrix		Air			Blank			Ambient Air		
Test Type		Initial			Initial			Initial		
Total or Dissolved		N			N			N		
CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	0.0639	0.0246	U	0.0639	0.0246	U	1.28	0.491

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810005-02			L810005-03			L810053-04		
Sample Number		359-0024			359-0025			359-0026		
Sample Location		TCP-03			TCP-01			TCP-04		
Sublocation		Ambient			Ambient			Ambient		
Date Analyzed		10/19/2018			10/19/2018			10/19/2018		
Matrix		Ambient Air			Ambient Air			Ambient Air		
Test Type		Initial			Initial			Initial		
Total or Dissolved		N			N			N		
CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	1.28	0.491	U	1.28	0.491	U	1.28	0.491

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810005-05			L810005-06			
Sample Number		359-0027			359-0028			
Sample Location		TCP-06			TCP-05			
Sublocation		Ambient			Ambient			
Date Analyzed		10/19/2018			10/19/2018			
Matrix		Ambient Air			Ambient Air			
Test Type		Initial			Initial			
Total or Dissolved		N			N			
CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	
71-43-2	Benzene	U	1.28	0.491	U	1.28	0.491	

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Table 2.1 Results of the LCS Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: LCS 101918

Analyte	LCS Spike Amount ppbv	LCS Recovered ppbv	% Recovery	QC Limits % Recovery
Benzene	1.00	1.04	104	92 - 120

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Table 2.2 Results of the Duplicate Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: 359-0027

Analyte	Initial Analysis ppbv	Duplicate Analysis ppbv	RPD	QC Limit RPD
Benzene	U	U	NC	≤25

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ED_002831_00000176-00065

SERAS-359-DAR-102218

USEPA
DateShipped: 10/18/2018
CarrierName: FedEx
AirbillNo:
WO# L810005

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Larry Martin
Contact Phone: 609-865-9306

No: 2-101818-135423-0011
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Pump #	OrificeID	Stop Pressure	Stop_Date	Stop_Time
01	359-0023	TCP-02	Ambient	SERAS SOP#1814	Ambient Air	1	10584	13922	-2.5	10/18/2018	3:00:00 PM
02	359-0024	TCP-03	Ambient	SERAS SOP#1814	Ambient Air	1	2021	13952	-2	10/18/2018	3:13:00 PM
03	359-0025	TCP-01	Ambient	SERAS SOP#1814	Ambient Air	1	13740	13917	-1.5	10/18/2018	3:30:00 PM
04	359-0026	TCP-04	Ambient	SERAS SOP#1814	Ambient Air	1	10539	223037	0	10/18/2018	3:43:00 PM

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for Analysis	Lozades/SERAS	10/18/18 1651	/SERAS	10/19/18 8:00	Intact
All Analysis	/SERAS	10/19/18 10:45	Bhupinder Lamra/SERAS	10/19/18 11:00	

07

SERAS-359-DAR-102218

USEPA
DateShipped: 10/18/2018
CarrierName: FedEx
AirbillNo:
WO# L810005

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Larry Martin
Contact Phone: 609-865-9306

No: 2-101818-135955-0012
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Pump #	OrificeID	Stop Pressure	Stop_Date	Stop_Time
05	359-0027	TCP-06	Ambient	SERAS SOP#1814	Ambient Air	1	2060	13908	0	10/18/2018	3:59:00 PM
06	359-0028	TCP-05	Ambient	SERAS SOP#1814	Ambient Air	1	10598	13997	- 1.5	10/18/2018	4:14:00 PM

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for Analysis	[signature] Lozados/SERAS	10/18/18 1650	[signature] /SERAS	10/19/18 8:00	Intact
All Analysis	[signature] /SERAS	10/19/18 10:45	[signature] /SERAS	10/19/18 11:00	

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SERAS-359-DAR-102218

USEPA
DateShipped: 10/18/2018
CarrierName: FedEx
AirbillNo:
WO# L810005

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Larry Martin
Contact Phone: 609-865-9306

No: 2-101818-140213-0013
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Pump #	OrificeID	Stop Pressure	Stop_Date	Stop_Time
07	359-0029	Trip Blank		SERAS SOP#1814	Blank	1	13735		-28.5	10/18/2018	4:20:00 PM

SJS

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples For Analyses	[signature] Leidos/SERAS	10/18/18 1649	[signature] /SERAS	10/19/18 8:00	Intact
All/Analysis	[signature] /SERAS	10/19/18 10:45	Bhupinder Parmar /SERAS	10/19/18 11:00	

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ANALYTICAL REPORT

Prepared by
Leidos Innovations Corporation
Scientific, Engineering, Response and Analytical Services

Tonawanda Coke Site
Buffalo, NY

October 2018

EPA Work Assignment No. SERAS-359
LEIDOS Work Order No. SER00359
EPA Contract No. EP-W-09-031

Submitted to
J. Schaefer
EPA/ERT
2890 Woodbridge Avenue
Edison, NJ 08837

D. Killeen
QA/QC Officer

10/22/18
Date

P. Carter
Program Manager

10/21/18
Date

Analysis by:
ERT/SERAS Laboratory

Prepared by:/Reviewed by:
S. Capil/ R. Varsolona

ED_002831_00000176-00069

Table of Contents

Appendix A will be furnished on request.

ED_002831_00000176-00070

TESTING LABORATORIES INFORMATION

Analysis of Volatile Organic Compounds in Air by SERAS Method #1814 "*Analysis of Volatile Organic Compounds (VOCs) in SUMMA Canister Air Samples by Gas Chromatography/Mass Spectrometry (GC/MS)*"

ERT/SERAS Laboratory
2890 Woodbridge Avenue
Edison, NJ 08837

All analyses were performed according to our NELAP-approved quality assurance program. The test results meet the requirements of the current NELAP standards, where applicable, except as noted in the laboratory case narrative provided. Results are intended to be considered in their entirety and apply only to those analyzed and reported herein.

ERT/SERAS Laboratory is certified by the New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID # 12023 for VOC analysis in air.

REPORT OF LABORATORY ANALYSIS
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Detailed Sample Information

SERAS Sample #	Field Sample #
L810006-01	359-0030
L810006-02	359-0031
L810006-03	359-0032
L810006-04	359-0033
L810006-05	359-0034
L810006-06	359-0035
L810006-07	359-0036
L810006-08	359-0037

ED_002831_00000176-00072

Introduction

SERAS personnel, in response to WA# SERAS-359, provided analytical support for environmental samples collected from the Tonawanda Coke Site in Buffalo, NY as described in the following table. The support also included QA/QC, data review and preparation of an analytical report containing analytical and QA/QC results.

The samples analyzed at SERAS were treated with procedures consistent with those specified in SERAS SOP #1008, *Sample Receiving, Handling and Storage.*

Chain of Custody #	Number of Samples	Sampling Date	Date Received	Date Analyzed	Matrix	Analysis/ Method	Laboratory	Data Package
2-101918-132939-0014	4	10/19/18	10/20/18	10/20/18	Ambient Air	VOC/SERAS SOP #1814	ERT/SERAS	AD 046
2-101918-133220-0015	3				Ambient Air			
	1				Blank			

Case Narrative

Sampling was conducted as per the site-specific Quality Assurance Project Plan (QAPP) and analyzed by the analytical methods as stated in the QAPP. The laboratory reported the data to three significant figures. Any other representation of the data is the responsibility of the user. Data were validated using a Stage 4 validation done manually (S4VM) in accordance with the "Guidance for Labeling Externally Validated Data for Superfund Use." All data validation flags have been inserted into the results tables.

VOCs in Air Package AD 046

The data package was examined and found to be acceptable.

The results presented in this report only relate to the samples analyzed. All results are intended to be considered in their entirety. The Environmental Response Team/Scientific, Engineering, Response and Analytical Services laboratory is not responsible for utilization of less than the complete report.

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Summary of Abbreviations

BFB	Bromofluorobenzene
BS	Blank Spike
BSD	Blank Spike Duplicate
^{O}C	Degree Centigrade
COC	Chain of Custody
conc	concentration
cont	continued
PCDD/PCDF	Polychlorinated dibenzo-p-dioxins (PCDD) and Polychlorinated dibenzofurans (PCDF)
DFTPP	Decafluorotriphenylphosphine
EMPC	Estimated maximum possible concentration
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/MS	Gas Chromatography/ Mass Spectrometry
Hg-CVAA	Mercury-Cold Vapor Atomic Absorption
ICP-AES	Inductively Coupled Plasma- Atomic Emission Spectroscopy
ID	Identification
IS	Internal Standard
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MDA	Minimum Detectable Activity
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular Weight
NA	Not Applicable or Not Available
NAD	Normalized Absolute Difference
NC	Not Calculated
NR	Not Requested/Not Reported
% D	Percent Difference
% R	Percent Recovery
SOP	Standard Operating Procedure
PCB	Polychlorinated Biphenyl
PDS	Post Digestion Spike
Percent RSD	Percent Relative Standard Deviation
ppbv	parts per billion by volume
ppm	parts per million
pptv	parts per trillion by volume
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RL	Reporting Limit
RPD	Relative Percent Difference
S4VM	Stage 4 validation done manually
SIM	Selected Ion Monitoring
SERAS	Scientific Engineering Response and Analytical Services
TIC	Tentatively Identified Compound
TCLP	Toxicity Characteristic Leaching Procedure
SVOC	Semi Volatile Organic Compound
VOC	Volatile Organic Compound
*	Value exceeds the acceptable QC limits

m^3	cubic meter	g	gram	kg	kilogram	L	liter
µg	microgram	µL	microliter	mg	milligram	mL	milliliter
ng	nanograms	pg	picogram	pCi	picocurie	σ	sigma

Data Validation Flags

J	Value is estimated	R	Rejected or Value is unusable
J+	Value is estimated high	U	Not detected
J-	Value is estimated low	UJ	Not detected and RL is estimated

Rev. 01/01/15, YRM

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ED_002831_00000176-00074

Table 1.1a Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		NA			L810006-08			L810006-01	
Sample Number		PS-Methodblank-102018			359-0037			359-0030	
Sample Location					Trip Blank			TCP-02	
Sublocation								Ambient	
Date Analyzed		10/20/2018			10/20/2018			10/20/2018	
Matrix		Air			Air			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv
71-43-2	Benzene	U	0.0200	0.00769	U	0.0200	0.00769	U	0.400	0.154

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810006-02			L810006-03			L810006-04	
Sample Number		359-0031			359-0032			359-0033	
Sample Location		TCP-03			TCP-03 CO			TCP-01	
Sublocation		Ambient			Ambient Collocated			Ambient	
Date Analyzed		10/20/2018			10/20/2018			10/20/2018	
Matrix		Ambient Air			Ambient Air			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.154	U	0.400	0.154	U	0.400	0.154

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number		L810006-05			L810006-06			L810006-07	
Sample Number		359-0034			359-0035			359-0036	
Sample Location		TCP-04			TCP-06			TCP-05	
Sublocation		Ambient			Ambient			Ambient	
Date Analyzed		10/20/2018			10/20/2018			10/20/2018	
Matrix		Ambient Air			Ambient Air			Ambient Air	
Test Type		Initial			Initial			Initial	
Total or Dissolved		N			N			N	
CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.154	U	0.400	0.154	U	0.400	0.154

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Table 1.1b Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	NA	L810006-08	L810006-01
Sample Number	PS-Methodblank-102018	359-0037	359-0030
Sample Location		Trip Blank	TCP-02
Sublocation			Ambient
Date Analyzed	10/20/2018	10/20/2018	10/20/2018
Matrix	Air	Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	0.0639	0.0246	U	0.0639	0.0246	U	1.28	0.491

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810006-02	L810006-03	L810006-04
Sample Number	359-0031	359-0032	359-0033
Sample Location	TCP-03	TCP-03 CO	TCP-01
Sublocation	Ambient	Ambient Collocated	Ambient
Date Analyzed	10/20/2018	10/20/2018	10/20/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	1.28	0.491	U	1.28	0.491	U	1.28	0.491

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810006-05	L810006-06	L810006-07
Sample Number	359-0034	359-0035	359-0036
Sample Location	TCP-04	TCP-06	TCP-05
Sublocation	Ambient	Ambient	Ambient
Date Analyzed	10/20/2018	10/20/2018	10/20/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	1.28	0.491	U	1.28	0.491	U	1.28	0.491

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ED_002831_00000176-00076

Table 2.1 Results of the LCS Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: LCS 102018

Analyte	LCS Spike Amount ppbv	LCS Recovered ppbv	% Recovery	QC Limits % Recovery
Benzene	1.00	1.01	101	92 - 120

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Table 2.2 Results of the Duplicate Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: 359-0033

Analyte	Initial Analysis ppbv	Duplicate Analysis ppbv	RPD	QC Limit RPD
Benzene	U	U	NC	≤25

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ED_002831_00000176-00078

USEPA
DateShipped: 10/19/2018
CarrierName: FedEx
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Larry Martin/samples receiving
Contact Phone: 609-865-9306

No: 2-101918-132939-0014
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

SERAS-359-DAR-102218

L810006

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Pump #	OrificeID	Stop Pressure	Stop_Date	Stop_Time
01	359-0030	TCP-02	Ambient	SERAS SOP#1814	Ambient Air	1	10604	13911	-3	10/19/2018	2:55:00 PM
02	359-0031	TCP-03	Ambient	SERAS SOP#1814	Ambient Air	1	10594	13988	-2	10/19/2018	3:07:00 PM
03	359-0032	TCP-03 CO	Ambient Collocated	SERAS SOP#1814	Ambient Air	1	10583	13990	-2	10/19/2018	3:07:00 PM
04	359-0033	TCP-01	Ambient	SERAS SOP#1814	Ambient Air	1	10616	223024	-2	10/19/2018	3:23:00 PM

SAS

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for Analyses	LOEDOS/SERAS	10/19/18 1654	/SERAS	10/20/18 10:50	Intact
All Analysis	/SERAS	10/20/18 10:50	/SERAS	10/20/18 10:50	

07

SERAS-359-DAR-102218

USEPA
DateShipped: 10/19/2018
CarrierName: FedEx
AirbillNo: L8100006

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Larry Martin/samples receiving
Contact Phone: 609-865-9306

No: 2-101918-133220-0015
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Pump #	OrificeID	Stop Pressure	Stop_Date	Stop_Time
05	359-0034	TCP-04	Ambient	SERAS SOP#1814	Ambient Air	1	10543	13953	-3.5	10/19/2018	3:34:00 PM
06	359-0035	TCP-06	Ambient	SERAS SOP#1814	Ambient Air	1	10595	13951	-0.5	10/19/2018	3:50:00 PM
07	359-0036	TCP-05	Ambient	SERAS SOP#1814	Ambient Air	1	10620	13925	-1.5	10/19/2018	4:17:00 PM
08	359-0037	Trip Blank		SERAS SOP#1814	Air	1	2057		-29.5	10/19/2018	4:25:00 PM

Special Instructions: Benzene only, 24-hour TAT prelims, 46-hour Final

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for Analysis	LCF000/SERAS	10/19/18 1700	/SERAS	10/20/18 10:30	Intact
All Analysis	/SERAS	10/20/18 10:50	/SERAS	10/20/18 10:50	

08

ANALYTICAL REPORT

Prepared by
Leidos Innovations Corporation
Scientific, Engineering, Response and Analytical Services

Tonawanda Coke Site
Buffalo, NY

November 2018

EPA Work Assignment No. SERAS-359
LEIDOS Work Order No. SER00359
EPA Contract No. EP-W-09-031

Submitted to
J. Schaefer
EPA/ERT
2890 Woodbridge Avenue
Edison, NJ 08837

D. Killeen — Date 11/16/18
QA/QC Officer

P. Carter — Date 11/16/18
Program Manager

Analysis by:
ERT/SERAS Laboratory

Prepared by:/Reviewed by:
S. Capil/ R. Varsolona

ED_002831_00000176-00081

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Appendix A will be furnished on request.

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TESTING LABORATORIES INFORMATION

Analysis of Volatile Organic Compounds in Air by SERAS Method #1814 "*Analysis of Volatile Organic Compounds (VOCs) in SUMMA Canister Air Samples by Gas Chromatography/Mass Spectrometry (GC/MS)*"

ERT/SERAS Laboratory
2890 Woodbridge Avenue
Edison, NJ 08837

All analyses were performed according to our NELAP-approved quality assurance program. The test results meet the requirements of the current NELAP standards, where applicable, except as noted in the laboratory case narrative provided. Results are intended to be considered in their entirety and apply only to those analyzed and reported herein.

ERT/SERAS Laboratory is certified by the New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID # 12023 for VOC analysis in air.

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Detailed Sample Information

SERAS Sample #	Field Sample #
L810007-01	359-0038
L810007-02	359-0039
L810007-03	359-0040
L810007-04	359-0041
L810007-05	359-0042
L810007-06	359-0043
L810007-07	359-0044
L810007-08	359-0045
L810007-09	359-0046
L810007-10	359-0047
L810007-11	359-0048
L810007-12	359-0049
L810007-13	359-0050
L810007-14	359-0051
L810007-15	359-0052

REPORT OF LABORATORY ANALYSIS
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Introduction

SERAS personnel, in response to WA# SERAS-359, provided analytical support for environmental samples collected from the Tonawanda Coke Site in Buffalo, NY as described in the following table. The support also included QA/QC, data review and preparation of an analytical report containing analytical and QA/QC results.

The samples analyzed at SERAS were treated with procedures consistent with those specified in SERAS SOP #1008, *Sample Receiving, Handling and Storage.*

Chain of Custody #	Number of Samples	Sampling Date	Date Received	Date Analyzed	Matrix	Analysis/ Method	Laboratory	Data Package
2-102218-100059-0017	6	10/20/18	10/22/18	10/2218 Through 10/23/18	Ambient Air	VOC/SERAS SOP #1814	ERT/SERAS	AD 047
	1				Blank			
	7	10/21/18			Ambient Air			
	1				Blank			

Case Narrative

Sampling was conducted as per the site-specific Quality Assurance Project Plan (QAPP) and analyzed by the analytical methods as stated in the QAPP. The laboratory reported the data to three significant figures. Any other representation of the data is the responsibility of the user. Data were validated using a Stage 4 validation done manually (S4VM) in accordance with the "Guidance for Labeling Externally Validated Data for Superfund Use." All data validation flags have been inserted into the results tables.

VOCs in Air Package AD 047

The data package was examined and found to be acceptable.

The results presented in this report only relate to the samples analyzed. All results are intended to be considered in their entirety. The Environmental Response Team/Scientific, Engineering, Response and Analytical Services laboratory is not responsible for utilization of less than the complete report.

Summary of Abbreviations

BFB	Bromofluorobenzene
BS	Blank Spike
BSD	Blank Spike Duplicate
°C	Degree Centigrade
COC	Chain of Custody
conc	concentration
cont	continued
PCDD/PCDF	Polychlorinated dibenzo-p-dioxins (PCDD) and Polychlorinated dibenzofurans (PCDF)
DFTPP	Decafluorotriphenylphosphine
EMPC	Estimated maximum possible concentration
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/MS	Gas Chromatography/ Mass Spectrometry
Hg-CVAA	Mercury-Cold Vapor Atomic Absorption
ICP-AES	Inductively Coupled Plasma- Atomic Emission Spectroscopy
ID	Identification
IS	Internal Standard
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MDA	Minimum Detectable Activity
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular Weight
NA	Not Applicable or Not Available
NAD	Normalized Absolute Difference
NC	Not Calculated
NR	Not Requested/Not Reported
% D	Percent Difference
% R	Percent Recovery
SOP	Standard Operating Procedure
PCB	Polychlorinated Biphenyl
PDS	Post Digestion Spike
Percent RSD	Percent Relative Standard Deviation
ppbv	parts per billion by volume
ppm	parts per million
pptv	parts per trillion by volume
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RL	Reporting Limit
RPD	Relative Percent Difference
S4VM	Stage 4 validation done manually
SIM	Selected Ion Monitoring
SERAS	Scientific Engineering Response and Analytical Services
TIC	Tentatively Identified Compound
TCLP	Toxicity Characteristic Leaching Procedure
SVOC	Semi Volatile Organic Compound
VOC	Volatile Organic Compound
*	Value exceeds the acceptable QC limits

m^3	cubic meter	g	gram	kg	kilogram	L	liter
µg	microgram	µL	microliter	mg	milligram	mL	milliliter
ng	nanograms	pg	picogram	pCi	picocurie	σ	sigma

Data Validation Flags

J	Value is estimated	R	Rejected or Value is unusable
J+	Value is estimated high	U	Not detected
J-	Value is estimated low	UJ	Not detected and RL is estimated

Rev. 01 01-15. VRM

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Table 1.1a Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	NA	L810007-07	L810007-15
Sample Number	PS-Methodblank 102218	359-0044	359-0052
Sample Location		Trip Blank	Trip Blank
Sublocation			
Date Analyzed	10/22/2018	10/22/2018	10/22/2018
Matrix	Air	Blank	Blank
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv	Result ppbv	RL ppbv	MDL ppbv
71-43-2	Benzene	U	0.0200	0.00769	U	0.0200	0.00769	U	0.0200	0.00769

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810007-01	L810007-02	L810007-03
Sample Number	359-0038	359-0039	359-0040
Sample Location	TCP-02	TCP-03	TCP-01
Sublocation	Ambient	Ambient	Ambient
Date Analyzed	10/22/2018	10/22/2018	10/22/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.154	U	0.400	0.154	U	0.400	0.154

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810007-04	L810007-05	L810007-06
Sample Number	359-0041	359-0042	359-0043
Sample Location	TCP-04	TCP-06	TCP-05
Sublocation	Ambient	Ambient	Ambient
Date Analyzed	10/22/2018	10/22/2018	10/22/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.154	U	0.400	0.154	U	0.400	0.154

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Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810007-08	L810007-09	L810007-10
Sample Number	359-0045	359-0046	359-0047
Sample Location	TCP-02	TCP-03	TCP-01
Sublocation	Ambient	Ambient	Ambient
Date Analyzed	10/22/2018	10/22/2018	10/23/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.154	U	0.400	0.154	U	0.400	0.154

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810007-11	L810007-12	L810007-13
Sample Number	359-0048	359-0049	359-0050
Sample Location	TCP-04	TCP-04CO	TCP-06
Sublocation	Ambient	Ambient Collocated	Ambient
Date Analyzed	10/23/2018	10/23/2018	10/23/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.154	U	0.400	0.154	U	0.400	0.154

Table 1.1a (cont) Results of the Analysis for Benzene (ppbv) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810007-14
Sample Number	359-0051
Sample Location	TCP-05
Sublocation	Ambient
Date Analyzed	10/23/2018
Matrix	Ambient Air
Test Type	Initial
Total or Dissolved	N

CAS No	Analyte	Result ppbv	*RL* ppbv	*MDL* ppbv
71-43-2	Benzene	U	0.400	0.154

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ED_002831_00000176-00088

Table 1.1b Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	NA	L810007-07	L810007-15
Sample Number	PS-Methodblank 102218	359-0044	359-0052
Sample Location		Trip Blank	Trip Blank
Sublocation			
Date Analyzed	10/22/2018	10/22/2018	10/22/2018
Matrix	Air	Blank	Blank
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	0.0639	0.0246	U	0.0639	0.0246	U	0.0639	0.0246

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810007-01	L810007-02	L810007-03
Sample Number	359-0038	359-0039	359-0040
Sample Location	TCP-02	TCP-03	TCP-01
Sublocation	Ambient	Ambient	Ambient
Date Analyzed	10/22/2018	10/22/2018	10/22/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	1.28	0.491	U	1.28	0.491	U	1.28	0.491

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810007-04	L810007-05	L810007-06
Sample Number	359-0041	359-0042	359-0043
Sample Location	TCP-04	TCP-06	TCP-05
Sublocation	Ambient	Ambient	Ambient
Date Analyzed	10/22/2018	10/22/2018	10/22/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3	Result µg/m3	*RL* µg/m3	*MDL* µg/m3
71-43-2	Benzene	U	1.28	0.491	U	1.28	0.491	U	1.28	0.491

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Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810007-08	L810007-09	L810007-10
Sample Number	359-0045	359-0046	359-0047
Sample Location	TCP-02	TCP-03	TCP-01
Sublocation	Ambient	Ambient	Ambient
Date Analyzed	10/22/2018	10/22/2018	10/23/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result ug/m3	*RL* ug/m3	*MDL* ug/m3	Result ug/m3	*RL* ug/m3	*MDL* ug/m3	Result ug/m3	*RL* ug/m3	*MDL* ug/m3
71-43-2	Benzene	U	1.28	0.491	U	1.28	0.491	U	1.28	0.491

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810007-11	L810007-12	L810007-13
Sample Number	359-0048	359-0049	359-0050
Sample Location	TCP-04	TCP-04CO	TCP-06
Sublocation	Ambient	Ambient Collocated	Ambient
Date Analyzed	10/23/2018	10/23/2018	10/23/2018
Matrix	Ambient Air	Ambient Air	Ambient Air
Test Type	Initial	Initial	Initial
Total or Dissolved	N	N	N

CAS No	Analyte	Result ug/m3	*RL* ug/m3	*MDL* ug/m3	Result ug/m3	*RL* ug/m3	*MDL* ug/m3	Result ug/m3	*RL* ug/m3	*MDL* ug/m3
71-43-2	Benzene	U	1.28	0.491	U	1.28	0.491	U	1.28	0.491

Table 1.1b (cont) Results of the Analysis for Benzene (µg/m^3) in Air
WA# SERAS-359, Tonawanda Coke Site

Method: SERAS SOP#1814
Lab Name: ERT/SERAS

Lab Sample Number	L810007-14
Sample Number	359-0051
Sample Location	TCP-05
Sublocation	Ambient
Date Analyzed	10/23/2018
Matrix	Ambient Air
Test Type	Initial
Total or Dissolved	N

CAS No	Analyte	Result ug/m3	*RL* ug/m3	*MDL* ug/m3
71-43-2	Benzene	U	1.28	0.491

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Table 2.1 Results of the LCS Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: LCS 102218

Analyte	LCS Spike Amount ppbv	LCS Recovered ppbv	% Recovery	QC Limits % Recovery
Benzene	1.00	1.04	104	92 - 120

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Table 2.2 Results of the Duplicate Analysis for Benzene in Air
WA# SERAS-359, Tonawanda Coke Site

Sample ID: 359-0042

Analyte	Initial Analysis ppbv	Duplicate Analysis ppbv	RPD	QC Limit RPD
Benzene	U	U	NC	≤25

Sample ID: 359-0045

Analyte	Initial Analysis ppbv	Duplicate Analysis ppbv	RPD	QC Limit RPD
Benzene	U	U	NC	≤25

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SERAS-035-DARR-1-11616

USEPA
DateShipped: 10/22/2018
CarrierName: Hand Delivered
AirbillNo:
WO# L810007

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Larry Martin/samples receiving
Contact Phone: 609-865-9306

No: 2-102218-100059-0017
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Pump #	OrificeID	Stop Pressure	Stop_Date	Stop_Time
01	359-0038	TCP-02	Ambient	SERAS SOP#1814	Ambient Air	1	10542	13927	-2.5	10/20/2018	2:50:00 PM
02	359-0039	TCP-03	Ambient	SERAS SOP#1814	Ambient Air	1	10599	13991	-5	10/20/2018	3:03:00 PM
03	359-0040	TCP-01	Ambient	SERAS SOP#1814	Ambient Air	1	2049	14019	-4.5	10/20/2018	3:17:00 PM
04	359-0041	TCP-04	Ambient	SERAS SOP#1814	Ambient Air	1	1822	13933	-9	10/20/2018	3:30:00 PM
05	359-0042	TCP-06	Ambient	SERAS SOP#1814	Ambient Air	1	1986	13950	-2	10/20/2018	3:57:00 PM
06	359-0043	TCP-05	Ambient	SERAS SOP#1814	Ambient Air	1	10552	13961	-4	10/20/2018	4:17:00 PM
07	359-0044	Trip Blank		SERAS SOP#1814	Blank	1	2028		-29	10/20/2018	4:15:00 PM
08	359-0045	TCP-02	Ambient	SERAS SOP#1814	Ambient Air	1	10529	223018	-0.5	10/21/2018	8:57:00 AM
09	359-0046	TCP-03	Ambient	SERAS SOP#1814	Ambient Air	1	14397	13915	-2	10/21/2018	9:10:00 AM

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final	SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for Analyses	[signature] LOGDOS/SERAS	10/22/18 1007	[signature] /SERAS	10/22/18 10:15	Intact
All /Analysis	[signature] /SERAS	10/22/18 11:00	Jay Patel / SERAS	10/22/18 11:00	

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SERAS-359-DARR1-111618

USEPA
DateShipped: 10/22/2018
CarrierName: Hand Delivered
AirbillNo:
WO# L810007

CHAIN OF CUSTODY RECORD
Site #: 359
Contact Name: Larry Martin/samples receiving
Contact Phone: 609-865-9306

No: 2-102218-100059-0017
Cooler #:
Lab: ERT/SERAS
Lab Phone: 732-321-4200

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Pump #	OrificeID	Stop Pressure	Stop_Date	Stop_Time
10	359-0047	TCP-01	Ambient	SERAS SOP#1814	Ambient Air	1	10615	223015	-1	10/21/2018	9:24:00 AM
11	359-0048	TCP-04	Ambient	SERAS SOP#1814	Ambient Air	1	10563	13987	-0.5	10/21/2018	9:39:00 AM
12	359-0049	TCP-04 CO	Ambient Collocated	SERAS SOP#1814	Ambient Air	1	10617	223016	-1.5	10/21/2018	9:39:00 AM
13	359-0050	TCP-06	Ambient	SERAS SOP#1814	Ambient Air	1	10547	223049	-1.5	10/21/2018	9:57:00 AM
14	359-0051	TCP-05	Ambient	SERAS SOP#1814	Ambient Air	1	10596	223020	-1	10/21/2018	10:16:00 AM
15	359-0052	Trip Blank		SERAS SOP#1814	Blank	1	1980		-29	10/21/2018	10:19:00 AM

Special Instructions: Benzene only, 24-hour TAT prelims, 48-hour Final

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for Analysis	LCERICS/SERAS	10/22/18 1008	/SERAS	10/22/18 10:15	Intact
All Analysis	/SERAS	10/23/18 11:00	Jay LJJ / SERAS	10/22/18 11:00	

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